UNIVERSITI TEKNOLOGI MARA

DEVELOPMENT OF SMART ADVISORY SYSTEM FOR SCHEDULED WASTES GENERATORS IN MALAYSIA

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for the degree of
Master of Science (Chem Eng)

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Candidate's Declaration

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the result of my own work, unless otherwise indicated or acknowledge as referenced work. This thesis has not been submitted to any other academic institution or non–academic institution for any other degree or qualification.

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ABSTRACT

Malaysia nowadays is a developing country that becoming industrialized nation by the year of 2020. Accordingly, to rapid growth of industry, the amounts of scheduled wastes generated also increased and lead our country to be more alert about this problem. Therefore, many rules and regulations have been enforcing to ensure the amount of scheduled wastes generated can be disposed in proper ways. The Department of Environment 7 years ago has already started an electronic reporting system called E-SWIS (Electronic Scheduled Waste Information System) and E-Consign (Electronic Consignment) which involved less paperwork and quicker tracking of waste movements, but its effectiveness is unproven. The system failed to discern and comprehend the material in-flow and out-flow of such complex successive scheduled wastes generators, transporters, recoveries and recycles, within the boundary system (country, unit operation, facilities). The lack of complete historical records of quantity and quality has resulted in a situation that makes the long-term system planning and/or short-term expansion programs intangible. A smart system, called SWSPro-1 was developed to overcome the problems. SWSPro-1 is a future waste management analysis tool for the sustainable optimization of multiple disposal and recycling prediction The main goal of SWSPro-1 applications are to help and assist waste generators, policy makers, and environmental consultants, making prediction regarding the amount of scheduled waste categories and estimated cost required for disposing their wastes, estimated landfill life span, and promoting waste minimization and sustainability. Besides, this application will help decision makers to identify the new and old scheduled wastes code, description for each code and the status of wastes. The software also can determine the Electronic Waste and can works as standalone software. This study needs further research to undergo a deem research to be more reliable and consist more functionality such as integrate with web browser, improve mathematical model equation to predict the composition and generation of scheduled waste, and increase the accuracy and alternative in the process selection of waste management by adding the number of treatment facilities. This application has a significant impact on the scheduled waste management

encompass cost, time consumption, technical effectiveness, waste minimization, and environmental. SWSPro-1 has been extensively validated. The results have been tested using established data and compared with results from published literature and waste management software to check the validity of equations used and programmed. The results obtained from the tools are found to be consistent and no significant deviation arising in all of the trials. Thus, SWSPro-1 is a good computational software for the consequence modeling of scheduled waste management.

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